

1 WHAT IS CLAIMED IS:

- 2 1. A process for producing a very high viscosity polyalphaolefin product
3 comprising contacting a feed consisting essentially of at least one
4 alphaolefin ^{decene or dodecene} ~~having from 4 to about 14 carbon atom~~ with an effective
5 oligomerizing amount of an acidic ionic liquid oligomerization catalyst,
6 maintaining said feed and oligomerization catalyst under preselected
7 oligomerization conditions for a sufficient time to oligomerize the
8 alphaolefin to the polyalphaolefin product, and recovering the high
9 viscosity polyalphaolefin product.
- 10 2. The process of claim 1 wherein the feed comprises 1-decene.
- 11 3. The process of claim 1 wherein the feed comprises 1-dodecene.
- 12 4. The process of claim 1 wherein the acidic ionic oligomerization catalyst
13 comprises a first component and a second component, said first
14 component comprising a compound selected from the group consisting
15 of aluminum halide, alkyl aluminum halide, gallium halide, and alkyl
16 gallium halide, and said second component is an ionic liquid
17 comprising a liquid salt containing quaternary ammonium, quaternary
18 phosphonium, or quaternary sulfonium.
- 19 5. The process of claim 4 wherein said first component is aluminum
20 halide or alkyl aluminum halide.
- 21 6. The process of claim 5 wherein said first component is aluminum
22 trichloride.
- 23 7. The process of claim 4 wherein said second component is selected
24 from one or more of hydrocarbyl substituted ammonium halide,
25 hydrocarbyl substituted imidazolium halide, hydrocarbyl substituted

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- 1 pyridinium halide, alkylene substituted pyridinium dihalide, or
2 hydrocarbyl substituted phosphonium halide.
- 3 8. The process of claim 7 wherein the second component is an alkyl
4 substituted ammonium halide containing one or more alkyl moieties
5 having from 1 to about 9 carbon atoms.
- 6 9. The process of claim 8 wherein the second component comprises at
7 least trimethyl amine hydrochloride.
- 8 10. The process of claim 7 wherein the second component is an alkyl
9 substituted imidazolium halide.
- 10 11. The process of claim 10 wherein the second component comprises at
11 least 1-ethyl-3-methyl-imidazolium chloride.
- 12 12. The process of claim 4 wherein the ratio of first component to the
13 second component of the oligomerization catalyst is within the range of
14 from about 1:1 to about 5:1.
- 15 13. The process of claim 5 wherein the ratio of the first component to the
16 second component is within the range of from about 1:1 to about 2:1.
- 17 14. The process of claim 1 including the additional step of hydrogenating
18 the unsaturated double bonds present in the polyalphaolefin product.
- 19 15. The process of claim 1 wherein the dimer in the product is reduced to
20 less than 2 weight percent.
- 21 16. A polyalphaolefin product having a viscosity of not less than
22 centistokes at 100°C made using the process of claim 1.

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- 1 17. The product of claim 16 having a viscosity of not less than
2 30 centistokes at 100°C.
- 3 18. The product of claim 17 wherein the product contains less than
4 2 weight percent of dimer.
- 5 19. A process for producing a very high viscosity polyalphaolefin product
6 which is characterized by a viscosity of at least 22 centistokes at
7 100°C, said process comprising contacting a feed consisting
8 essentially of at least one alphaolefin ^{of either decane or dodecane} ~~having from 4 to about 14 carbon~~
9 ~~atom~~ with an effective oligomerizing amount of a acidic binary ionic
10 liquid oligomerization catalyst having a first component consisting of an
11 aluminum halide or an alkyl aluminum halide and a second component
12 consisting of a quaternary ammonium selected from selected from a
13 quaternary ammonium halide containing one or more alkyl moieties
14 having from 1 to about 9 carbon atoms or a hydrocarbonyl substituted
15 imidazolium halide; maintaining said feed and oligomerization catalyst
16 under preselected oligomerization conditions for a sufficient time to
17 oligomerize the alphaolefin to the polyalphaolefin product; and
18 recovering the high viscosity polyalphaolefin product.
- 19 20. The process of claim 19 wherein the acidic binary ionic liquid
20 oligomerization catalyst comprises a first component of aluminum
21 trichloride and a second component of trimethylamine hydrochloride.
- 22 21. The process of claim 19 wherein the acidic binary ionic liquid
23 oligomerization catalyst comprises a first component of aluminum
24 trichloride and a second component of 1-ethyl-3-methyl-imidazolium
25 chloride.

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- 1 22. The process according to claims 20 or 21 wherein the mole ratio of
- 2 aluminum trichloride to the second component is within the range of
- 3 from about 1:1 and 2:1.

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